

Amendment to the Claims:

This listing of claims will replace all versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) ~~[[An]]~~A hydraulic cylinder comprising:
a sleeve cylinder, stationary between extended and retracted positions, for substantially defining a second hydraulic fluid chamber;
an internal cylinder, substantially retained within the sleeve cylinder, for substantially defining a first hydraulic fluid chamber;
a piston having a piston rod, substantially retained within the sleeve cylinder, and a piston cap, substantially retained within the internal cylinder;
an inner portion, substantially defined between the piston cap and an internal cylinder piston rod gland, and adapted to displace the sleeve and internal cylinder to the retracted position upon being filled with hydraulic fluid, to thereby deliver a second power stroke;
a first fluid connection for hydraulically connecting to the first and second chambers;
a second fluid connection for hydraulically connecting to the inner portion; and
a hydraulic system for alternately pressurizing one of the first and second fluid connections while venting the respective other of the first and second fluid connections, so as to effect displacement of the internal cylinder between the extended portion and the retracted position;
wherein the internal cylinder is adapted to be displaced to the extended position to deliver a power stroke upon filling either the first or second hydraulic chambers with hydraulic fluid,
and
wherein the first fluid connection comprises a sequence valve including an operative state for detecting a predetermined pressure in the first chamber and, upon detecting the predetermined pressure, opening the valve to pressurize the second chamber.
2. (Canceled)

3. (Canceled)

4. (Currently Amended) The hydraulic cylinder of claim ~~[[3]]~~ wherein the hydraulic system comprises:

~~[[an]]~~ a hydraulic pump for pressurizing the respective fluid connections;

a fluid reservoir for venting the respective fluid connections; and

~~[[an]]~~ a hydraulic valve for respectively switching the respective fluid connections between the pump and the tank.

5. (Original) The hydraulic cylinder of claim 4 wherein the hydraulic valve further comprises:

a first operative position for connecting the first fluid connection to the hydraulic pump and the second fluid connection to the fluid reservoir; and

a second operative position for connecting the first fluid connection to fluid reservoir and the second fluid connection to the hydraulic pump.

6. (Canceled)

7. (Original) The hydraulic cylinder of claim 1 wherein the sleeve cylinder includes a base in operative contact with a machine component, reciprocally to drive the internal cylinder.

8. (Canceled)

9. (Canceled)

10. (Canceled)

11. (Currently Amended) ~~[[An]]~~A hydraulic system comprising:

a base in operative contact with a machine component, for delivering mechanical power to the machine component;

an hydraulic cylinder for reciprocally driving the machine component , the hydraulic cylinder comprising:

a sleeve cylinder, in mechanical contact with the base, and stationary between extended and retracted positions, for substantially defining a second hydraulic fluid chamber;

an internal cylinder, substantially retained within the sleeve cylinder, for substantially defining a first hydraulic fluid chamber;

a piston having a piston rod, substantially retained within the sleeve cylinder, and a piston cap, substantially retained within the internal cylinder;

an inner portion, substantially defined between the piston cap and an interior portion of the internal cylinder;

a first fluid connection for hydraulically connecting to the first and second chambers, the first fluid connection comprising a sequence valve, including:

a first operative state for pressurizing the first chamber and creating a negative pressure in the second chamber to draw in fluid; and

a second operative state for detecting a predetermined pressure in the first chamber and, upon detecting the predetermined pressure, opening the valve to pressurize the second chamber;

a second fluid connection for hydraulically connecting to the inner portion;

a hydraulic system for alternately pressurizing one of the first and second fluid connections while venting the respective other of the first and second fluid connections, so as to effect displacement of the sleeve cylinder between the extended position and the retracted position;

wherein the internal cylinder is adapted to be displaced to the extended position to deliver a first power stroke upon pressurizing the first and second hydraulic chambers with hydraulic fluid; and

wherein the inner portion is adapted to displace the sleeve cylinder and internal cylinder to the retracted position upon being pressurized with hydraulic fluid, to thereby deliver a second power stroke.

12. (Canceled)

13. (Currently Amended) The hydraulic system of claim [[12]]11 wherein the hydraulic system comprises:

[[an]]a hydraulic pump for pressurizing the respective fluid connections;
a fluid reservoir for venting the respective fluid connections; and
[[an]]a hydraulic valve for respectively switching the respective fluid connections between the pump and the tank.

14. (Original) The hydraulic system of claim 13 wherein the hydraulic valve further comprises:

a first operative position for connecting the first fluid connection to the hydraulic pump and the second fluid connection to the fluid reservoir; and
a second operative position for connecting the first fluid connection to fluid reservoir and the second fluid connection to the hydraulic pump.

15. (Canceled)

16. (Currently Amended) The hydraulic system of claim [[12]]11 wherein the first fluid connection comprises a valving system for selectively pressurizing at least one of the first and second chambers, so as to provide a variable force hydraulic cylinder.

17. (Original) The hydraulic system of claim 16 wherein the valving system comprises a four-way valve that can be selectively actuated to respectively admit pressurized fluid to one of the first and second fluid lines and to admit return flow from the respective other of the first and second fluid lines.

18. (Original) The hydraulic system of claim 17 wherein the valving system further comprises a two-way valve in the first fluid line for admitting pressurized fluid into the first fluid chamber in a first speed mode, for displacing internal cylinder, thereby creating a negative pressure in the second chamber for opening a first check valve and passively drawing fluid thereinto.

19. (Currently Amended) The hydraulic system of claim 18 wherein the valving system further comprises a sequence valve in the first fluid line for sensing a first predetermined system pressure and opening to admit pressurized fluid to the second fluid chamber while closing the two-way valve in the first speed mode, for transferring fluid to the second chamber[. To]]to create a second speed mode.

20. (Original) The hydraulic system of claim 19 wherein the valving system further comprises a second sequence valve in the first fluid line for sensing a second predetermined system pressure and opening to admit pressurized fluid to both the first and second fluid chambers in a third speed mode.

21. (Original) The hydraulic system of claim 11 wherein:

the sleeve cylinder further comprises a sleeve cylinder open end for receiving the internal cylinder, and a sleeve cylinder closed end for affixing an attachment end of the piston rod, opposite from the piston cap;

the internal cylinder further comprises an internal cylinder closed end and an internal cylinder open end for receiving the piston cap, further comprising a cylinder seal for enclosing the internal cylinder open end, wherein the seal includes an aperture for admitting the piston rod;

wherein the volume enclosed by the sleeve cylinder, the sleeve cylinder closed end and the cylinder seal defines the second hydraulic fluid chamber;

wherein the volume enclosed by the internal cylinder closed end and the piston cap defines the first hydraulic fluid chamber; and

wherein the volume enclosed by the cylinder seal and the piston cap defines the inner portion.

22. (Original) The hydraulic system of claim 21 further comprising a second hydraulic fluid chamber port for admitting hydraulic fluid, formed in one of the sleeve cylinder and the sleeve cylinder closed end.

23. (Original) The hydraulic system of claim 21 further comprising a first hydraulic fluid chamber port for admitting hydraulic fluid, formed in one of the internal cylinder near the internal cylinder closed end, and a fluid passage formed through the piston rod.

24. (Original) The hydraulic system of claim 21 further comprising an inner portion port for admitting hydraulic fluid, formed in a fluid passage formed through the piston rod.

25. (Original) The hydraulic system of claim 21 further comprising:

- a shaft seal retained near the sleeve cylinder open end for providing a fluid seal with the internal cylinder;

- a inner portion port for admitting hydraulic fluid, formed in the sleeve cylinder near the shaft seal; and

- a second inner portion port for admitting hydraulic fluid, formed in the internal cylinder near the cylinder seal.

26. (New) A hydraulic system comprising:

- a base in operative contact with a machine component, for delivering mechanical power to the machine component;

- a hydraulic cylinder for reciprocally driving the machine component , the hydraulic cylinder comprising:

- a sleeve cylinder, in mechanical contact with the base, and stationary between extended and retracted positions, for substantially defining a second hydraulic fluid chamber;

- an internal cylinder, substantially retained within the sleeve cylinder, for substantially defining a first hydraulic fluid chamber;

- a piston having a piston rod, substantially retained within the sleeve cylinder, and a piston cap, substantially retained within the internal cylinder;

- an inner portion, substantially defined between the piston cap and an interior portion of the internal cylinder,

wherein the internal cylinder is adapted to be displaced to the extended position to deliver a first power stroke upon pressurizing the first and second hydraulic chambers with hydraulic fluid and

wherein the inner portion is adapted to displace the sleeve cylinder and internal cylinder to the retracted position upon being pressurized with hydraulic fluid, to thereby deliver a second power stroke;

a first fluid connection for hydraulically connecting to the first and second chambers, the first fluid connection comprising a valving system for selectively pressurizing at least one of the first and second chambers so as to provide a variable force hydraulic cylinder;

a second fluid connection for hydraulically connecting to the inner portion; and

a hydraulic system for alternately pressurizing one of the first and second fluid connections while venting the respective other of the first and second fluid connections, so as to effect displacement of the sleeve cylinder between the extended position and the retracted position,

wherein the valving system comprises:

a four-way valve that can be selectively actuated to respectively admit pressurized fluid to one of the first and second fluid lines and to admit return flow from the respective other of the first and second fluid lines,

a two-way valve in the first fluid line for admitting pressurized fluid into the first fluid chamber in a first speed mode, for displacing internal cylinder, thereby creating a negative pressure in the second chamber for opening a first check valve and passively drawing fluid thereinto, and

a sequence valve in the first fluid line for sensing a first predetermined system pressure and opening to admit pressurized fluid to the second fluid chamber while closing the two-way valve in the first speed mode, for transferring fluid to the second chamber to create a second speed mode.

27. (New) The hydraulic system of claim 26 wherein the valving system further comprises a second sequence valve in the first fluid line for sensing a second predetermined

system pressure and opening to admit pressurized fluid to both the first and second fluid chambers in a third speed mode.